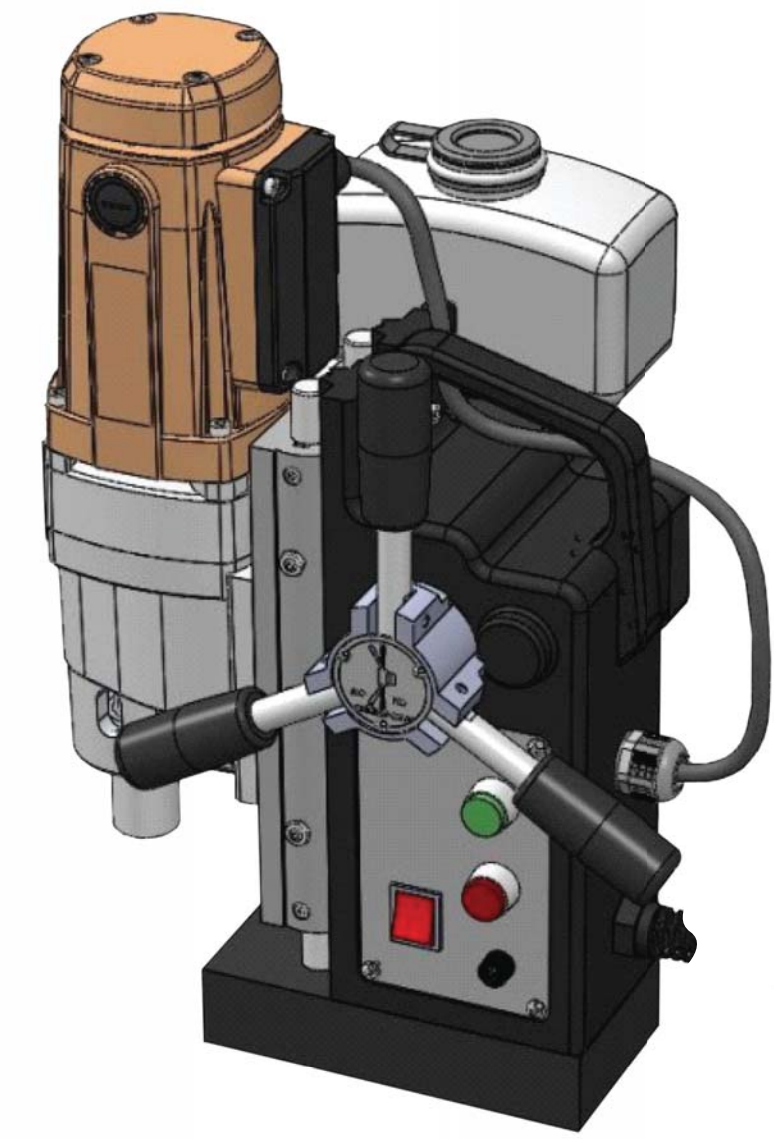
STEELMASTER®

SMD60AUTO
DRILLING MACHINE

OPERATOR'S MANUAL



PART# SMD60AUTO

BEFORE USE, ENSURE EVERYONE USING THIS MACHINE READS AND UNDERSTANDS ALL SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL.

Serial #..... Date of Purchase.....

IMPORTED & DISTRIBUTED BY

INDUSTRIAL TOOL & MACHINERY SALES
18 BUSINESS ST
YATALA QLD 4207 AUSTRALIA

T 07 3287 1114
F 07 3287 1115
E sales@industrialtool.com.au
W www.industrialtool.com.au

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In addition to any warranties or conditions implied by applicable Statute or Regulations, Industrial Tool & Machinery Sales warrants all of it's products against defective workmanship and faulty materials for a period of twelve (12) months from the date of purchase, unless otherwise stated. At our option we will repair or replace, free of charge, any item on the condition that:

- The complete machine or tool is returned, freight prepaid to ITM or one of it's authorised service agents as directed by ITM, and is found to have a material or constructional defect.
- The machine or tool has not been subject to misuse, neglect or damage by accident.
- The fault is not a result of normal "wear and tear".
- Written permission has been received from ITM prior to commencement of repair.
- Repairs, tampering or modification carried out by unauthorised personnel will void all warranty.
- Consumable items such as cutting tools, pilot pins, saw blades, grinding wheels etc. are NOT covered by warranty.

Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

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	List of Contents with Magnetic Drill Unit	Check List
1	Operator's Manual	YES/NO
2	Coolant Bottle	YES/NO
3	Safety Chain	YES/NO
4	Arbor--MT2 (3/4" bore)	YES/NO
5	4mm Hexagon Key	YES/NO
6	3mm Hexagon Key	YES/NO

1. GENERAL INFORMATION

1.1. Application

The SMD60AUTO is a drilling machine with electromagnetic base designed to drill holes with diameters of up to 60mm (2.36'') to the maximum depth of 75mm (3'') through the use of annular cutters.

The electromagnetic base allows the drilling machine to be fixed to ferromagnetic surfaces with a force that ensures user safety and proper machine operation. A safety strap protects the machine from dropping in case of a power loss.

1.2. Technical data

VOLTAGES	230V, 50/60HZ
NORMAL FULL LOAD OUTPUT	1,550 W
MAGNET SIZE	178 x 94 x 43mm
MAGNET FORCE AT 20°C WITH 25mm minimum plate thickness The use on any material less than 25mm thick will progressively reduce the magnetic performance. If possible, substitute material should be positioned under the magnet and work piece to equate to a suitable material thickness. If this is not possible, an alternative secure method of restraining the machine MUST be used.	1,400kgf
OVERALL DIMENSIONS	
HEIGHT - MAXIMUM EXTENDED	620mm
HEIGHT - MINIMUM	430mm
WIDTH (INCLUDING HAND WHEEL)	200mm
LENGTH OVERALL (INCLUDING GUARD)	260mm
STROKE	190mm
NET WEIGHT	19.5kg
MAXIMUM HAND/ARM VIBRATION MAGNITUDE (MEASURED AT HANDLE DURING OPERATION IN ACCORDANCE WITH ISO5349, USING A 22MM CUTTER THROUGH 13MM MS PLATE)	0.82 M/S^2
Estimate of likely daily vibration exposure. Operation 30 holes @ 2 minute/hole.	0.29m/s^2 A(8)
AVERAGE NOISE LEVEL DURING CUTTING AT OPERATORS EAR POSITION.	90DB(A)

2. SAFETY INSTRUCTIONS

1. Before beginning, read this Operator's Manual and complete proper occupational health and safety training.
2. The machine must be used only in applications specified in this Operator's Manual.
3. The machine must be complete and all parts must be genuine and fully operational.
4. The electrical supply specifications must conform to those specified on the rating plate.
5. The machine must be plugged into a properly grounded (earthed) socket-outlet. The electrical supply must be protected with a 16 A fuse for 230 V. When used on building sites, supply the machine through an isolation transformer made with class II protection only.
6. Never carry the machine by the cord or pull it to disconnect the plug from the power outlet as this may damage the power cord and result in electric shock.
7. Transport and position the machine using the carrying handle, with the magnet switch set to position 'O' (off).
8. Untrained bystanders must not be present in the vicinity of the machine.
9. Before beginning, check the condition of the machine and electrical supply, including the power cord, plug, control panel components, and cutters.
10. Keep the machine dry. Exposure to rain, snow, or frost is prohibited.
11. Never stay below the machine placed at heights.
12. Keep the work area well lit, clean, and free of obstacles.
13. Mount the annular cutter securely using the set screws. Remove adjusting keys and wrenches from the work area before connecting the plug to the power outlet.
14. Never use dull or damaged cutters.
15. Mount and dismount cutters using protective gloves and with the power cord unplugged from the power outlet.
16. Never use annular cutters without the pilot pin except when drilling incomplete through holes.
17. Mount only annular cutters with the maximum drilling diameter of 60mm (2.36") and the maximum drilling depth of 75mm (3").
18. Never use the machine in the vicinity of flammable liquids or gases, or in explosive environments.
19. Using the machine on surfaces that are rusty, covered with a thick paint layer, uneven, or not rigid is prohibited.
20. Use the safety strap in all operating positions. The strap must be tight and fastened to a securely fixed element either through the opening in the machine body or by catching the strap on the carrying handle. Never insert the strap into the buckle from the front.
21. Before every use, inspect the machine to ensure it is not damaged. Check whether any part is cracked or improperly fitted. Make sure to maintain proper conditions that may affect the operation of the machine.
22. Always use eye and hearing protection and protective clothing during operation. Do not wear loose clothing.
23. Proceed with caution when drilling plate with a thickness less than 10 mm (0.4") as the adhesion force depends on material thickness and is significantly lower for thin plate.
24. The entire surface of the electromagnetic base bottom must be in full contact with the workpiece. Before every positioning, wipe the workpiece with coarse-grained sandpaper.

25. Do not touch moving parts or chips formed during milling. Prevent objects from being caught in moving parts.
26. After every use, remove metal chips and excess coolant from the machine. Do not remove chips with bare hands.
27. Maintain the machine and tools with care. Cover steel parts with a thin grease layer to protect them against rust when not in use for any extended period.
28. Perform maintenance only with the machine unplugged from the power outlet.
29. All repairs must only be performed by an ITM approved repairer or service agent.
30. If the machine falls on from any height, is wet, or has any other damage that could affect the safe operation of the machine, stop the operation and immediately send the machine to the service centre for inspection and repair.
31. Never leave the machine unattended during operation.
32. Remove from the worksite and store in a secure and dry location, when not in use remove the cutter and pin from the arbor.

3. START UP AND OPERATION

All safety precautions must be adhered to.

3.1. Mounting and operating the annular cutter

Unplug the power cord from the power outlet and raise the motor by rotating the spoke handles clockwise (1, Figure 3). Insert the proper pilot pin into the annular cutter (2), then wear protective gloves and place the cutter into the arbor (3) in such a way to align the flats (4) with the set screws (5). Finally, tighten both set screws with the supplied 4 mm hex wrench. To remove the cutter, proceed in reverse order.

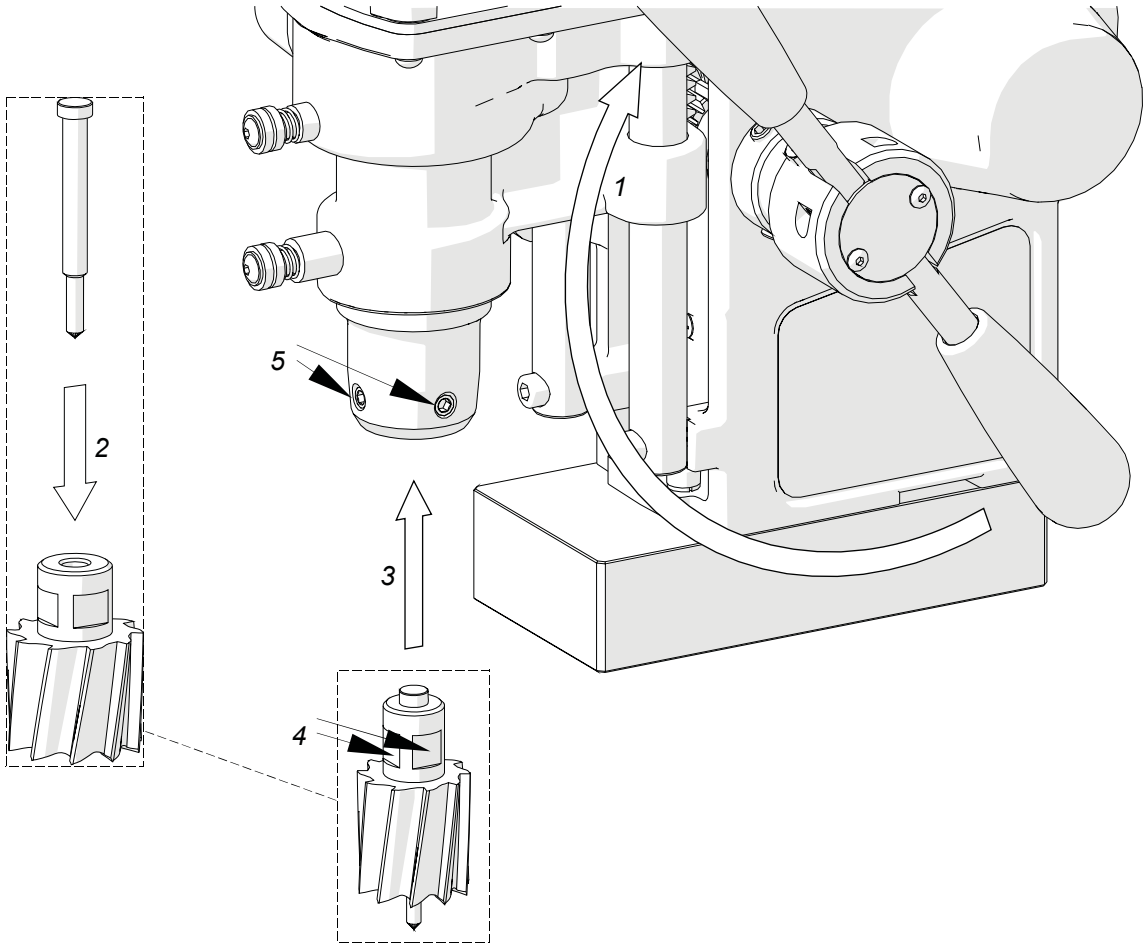


Figure 3. Mounting the annular cutter

Figure 4 shows how annular cutters operate. As the cutter penetrates the workpiece, the pilot pin recesses into the arbor and tightens the spring. As a result, after the cutter goes through the entire thickness, the slug core is expelled from the cutter. The pilot pin also allows application of coolant to the inner surface of the annular cutter as it is depressed.

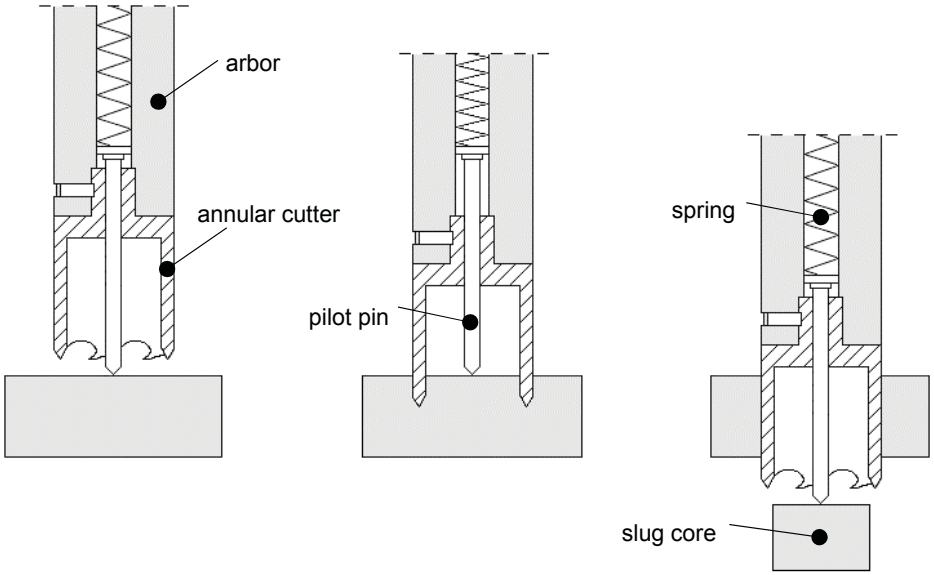


Figure 4. Annular cutters operation

Annular cutters are designed to establish only through holes shown in Figure 5. When drilling incomplete through holes the pilot pin must not be used.

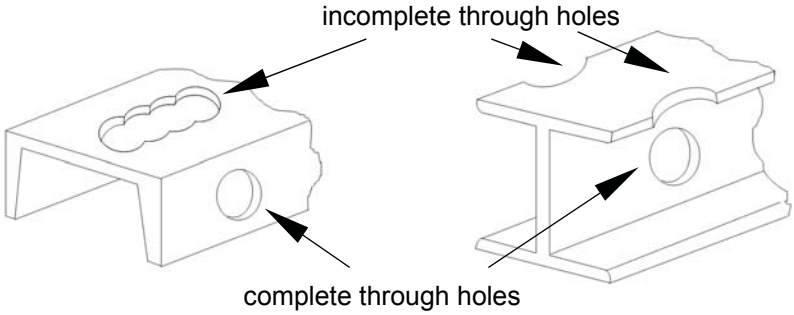
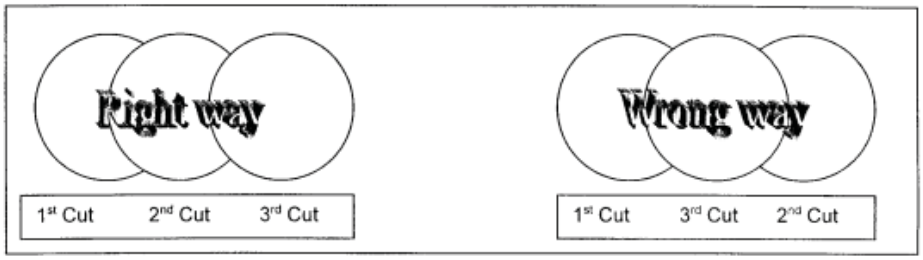


Figure 5. Types of holes drilled with annular cutters

- Always ensure that the slug has been ejected from the previous hole before commencing to cut the next.



- Always cut overlapping holes as illustrated above – do not use excessive pressure and ensure cutting fluid is reaching teeth of the cutter.
- If the slug sticks in the cutter, move the machine to a flat surface, switch on the magnet and gently bring the cutter down to make contact with the surface. This will usually straighten a cocked slug and allow it to eject normally.
- Cutter breakage is usually caused by insecure anchorage and a loosely fitting slide. (Refer to routine maintenance instructions).

3.2. Operating Instructions

Keep the inside of the cutter clear of swarf. It restricts the operating depth of the cutter.

- Ensure that the coolant bottle contains sufficient cutting oil to complete the required operating duration. Refill as required.
- Occasionally depress the pilot to ensure cutting fluid is being correctly metered.
- Cutting (auto-feeding) procedure

1. First select handle feeding method; manual or auto-feeding.
2. Switch on the magnet.
3. Start the motor by depressing the green start button. Then handle will be fed automatically. Feeding speed is about 15.0mm/min.
4. About 3 seconds after cutting is finished, the motor stops automatically.
5. Change the handle to manual mode.
6. Slide up the motor for next hole cutting.

3.3. Control system of the electromagnetic base holding force

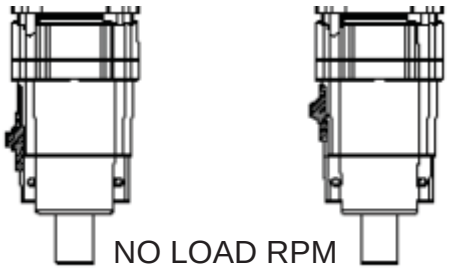
The SMD60AUTO drilling machine incorporates a holding force control system to monitor the adhesion force of the electromagnetic base to the surface. The force value depends on several factors; such as type, thickness, flatness, and roughness of the surface, presence of paint, rust or other contaminants, supply voltage fluctuations, and the wear of the electromagnetic base bottom. With the motor off, the base provides a fraction of the maximum holding force. Once the motor is started, the holding force rises to the maximum.

If the holding force falls below a safe operating value, the control system will not allow the machine to operate. Additionally, the system will prevent the startup of the motor if the machine is placed on a surface thinner than 6 mm (0.23'') as such thickness does not provide sufficient holding force. In such case, the adhesion force will be only about 25 % of the force attained on a standard 22 mm (0.87'') flat plate.

If the motor does not continue operation after the green MOTOR button is pushed and released, it means that the control system is operating properly and preventing further drilling because of too low adhesion force.

3.4. Speed selection

The SMD60AUTO is equipped with a mechanical two-speed gearbox. Select the required speed by pressing-in, shifting and engaging. Change the speed only when the machine is not running, and support the gear-changing by slightly rotating the spindle.



NO LOAD RPM

1^{ST} - 250RPM 2^{ND} - 670RPM

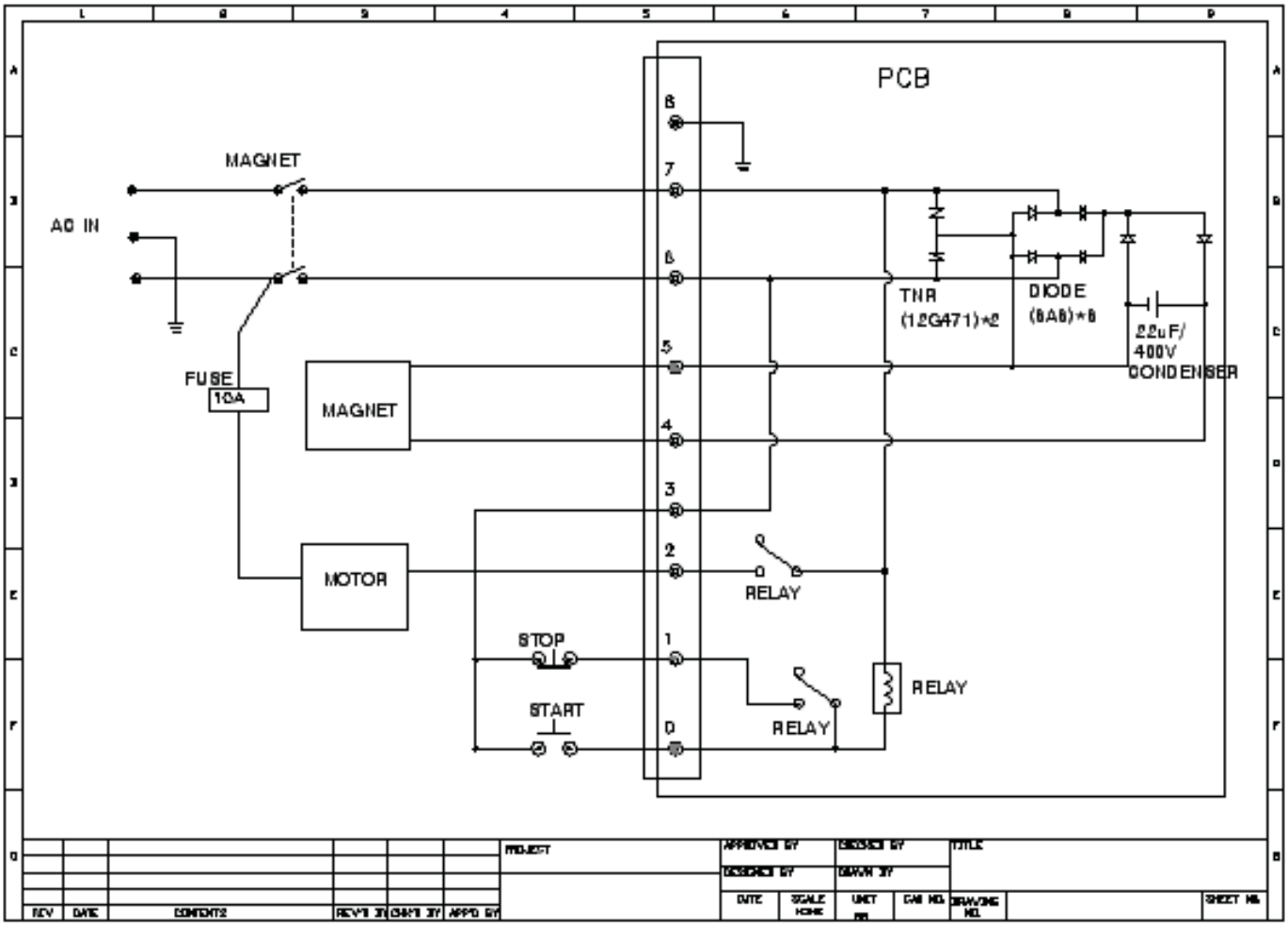
In case of cutting normal mild steel with cutters under 35mm dia. 2nd gear is recommendable. And for cutters over 40mm dia. 1st gear should be selected.
For cutters around 36 ~ 39 mm dia. It depends on situation. Specially the material to be cut is very important.

PROBLEM SOLVING

Problem	Cause	Remedy
1. Magnetic base won't hold effectively	Material being cut may be too thin for efficient holding of magnet.	Attach an additional piece of metal under work-piece where magnet will be located, or mechanically clamp magnetic base to work-piece.
	Swarf or dirt under magnet.	Clean magnet.
	Irregularity on magnet face or work-piece.	Use extreme care, file only imperfections flush to surface.
	Insufficient current going to magnet during drilling cycle.	Confirm power supply and output from control unit.
2. Cutter skips out of centre-punch mark at initiation of cut	Magnetic base is not holding effectively.	See causes and remedies above.
	Too much feed pressure at start of cut.	Light pressure until a groove is cut. The groove then serves as a stabilizer.
	Cutter is worn, chipped or incorrectly sharpened.	Replace or re-sharpen. Sharpening service is available.
	Poor centre-punch mark; weak pilot spring; pilot not centred in centre-punch mark.	Improve centre-punch and/or replace worn parts.
	Worn or bent pilot, worn pilot hole.	Replace parts.
3. Excessive drilling pressure required.	Incorrectly re-sharpened, worn or chipped cutter.	Re-sharpen or replace.
	Coming down on swarf lying on surface of work-piece.	Clean work-piece. Take care not to start a cut on swarf.
	Gibs out of adjustment or lack of lubrication.	Lubricate gib and/or adjust grub screws.
	Swarf accumulated (packed) inside cutter.	Clear cutter.
	Incorrect speed selection.	Select appropriate speed.

4. Excessive cutter breakage	Excessive cutter breakage.	Remove cutter, clean part thoroughly and replace.
	Incorrectly re-sharpened or worn cutter.	Always have a new cutter on hand to refer to for correct tooth geometry, together with instruction sheet.
	Cutter skipping.	See causes and remedies (2)
	Slide-ways need adjustment.	Slide-ways need adjustment.
	Cutter not attached tightly to arbor.	Retighten.
	Insufficient use of cutting oil or unsuitable type of oil.	Fill arbor with an oil of light viscosity and check to be sure oil is being metered into cutter when pilot is depressed. If not, check pilot groove and arbor internally for dirt or apply oil externally. Even a small amount of oil is very effective.
5. Excessive cutter wear.	Incorrectly re-sharpened cutter.	Refer to instructions and a new cutter for proper tooth geometry.
	Insufficient or spasmodic cutting pressure.	Use sufficient steady pressure to slow the drill down. This will result in optimum cutting speed and chip load.

WIRING DIAGRAM



Warning - this appliance must be earthed!

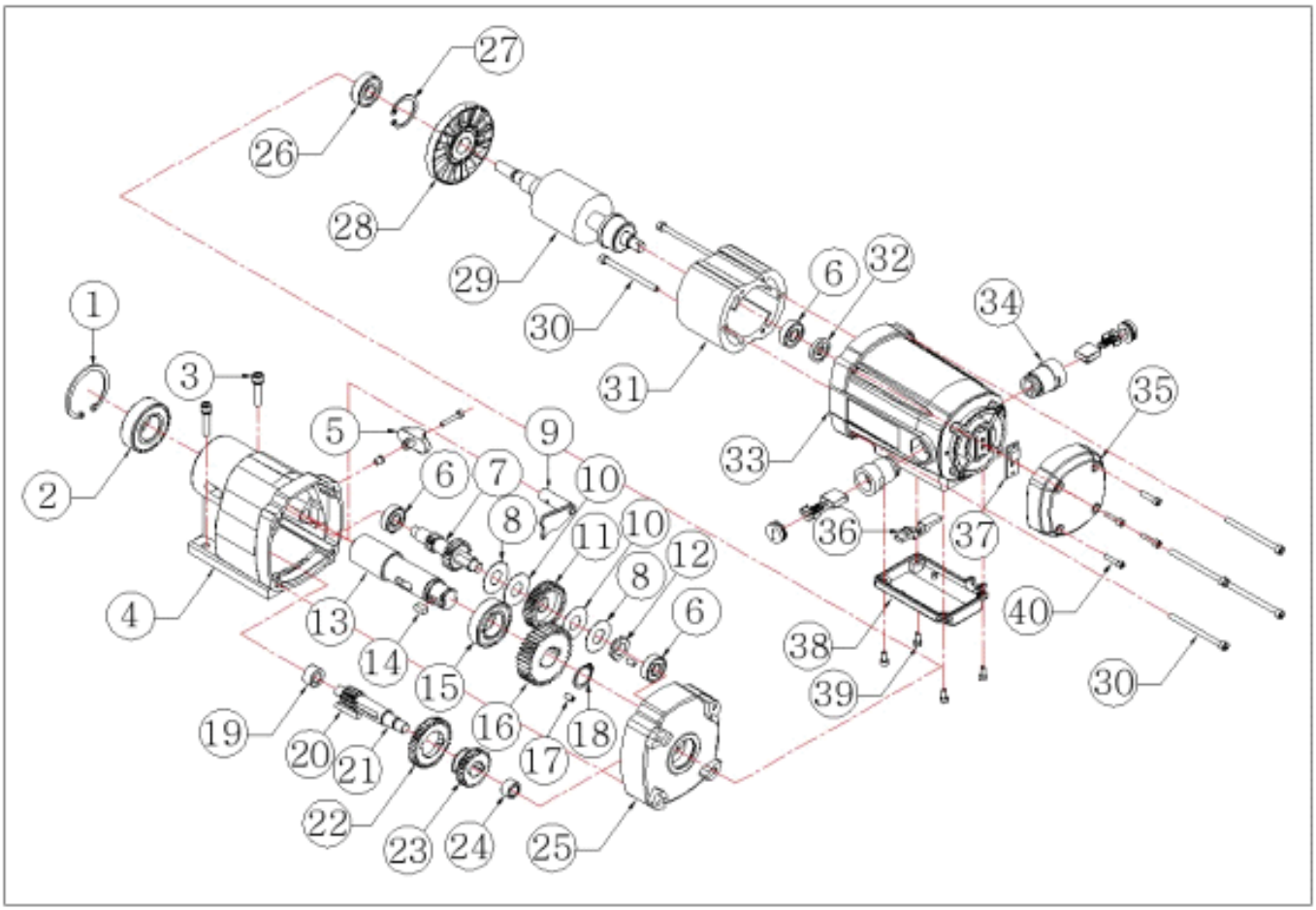
Insulation resistance test
With the magnet switch in the on position, apply a voltage of 1.5Kv between the live connection on the mains plug and the frame of the machine for a duration of 7 seconds. The reading obtained should not fall below infinity. Should a fault be indicated, it must be found and rectified.

Slide & gib adjustment -- patented

1. New sliding system : machines have very exotic and stable sliding system. It consists of 3 main parts ; slide board, precisely ground bar & adjustment gib. Basically it has very wear-resistent structure and keeps first condition as time goes. It helps to cut comparatively bigger holes easier than normal dove-tail system without any bad movement in sliding area.

2. Gib adjustment : adjust the gib using side bolts loose or tight, if necessary.

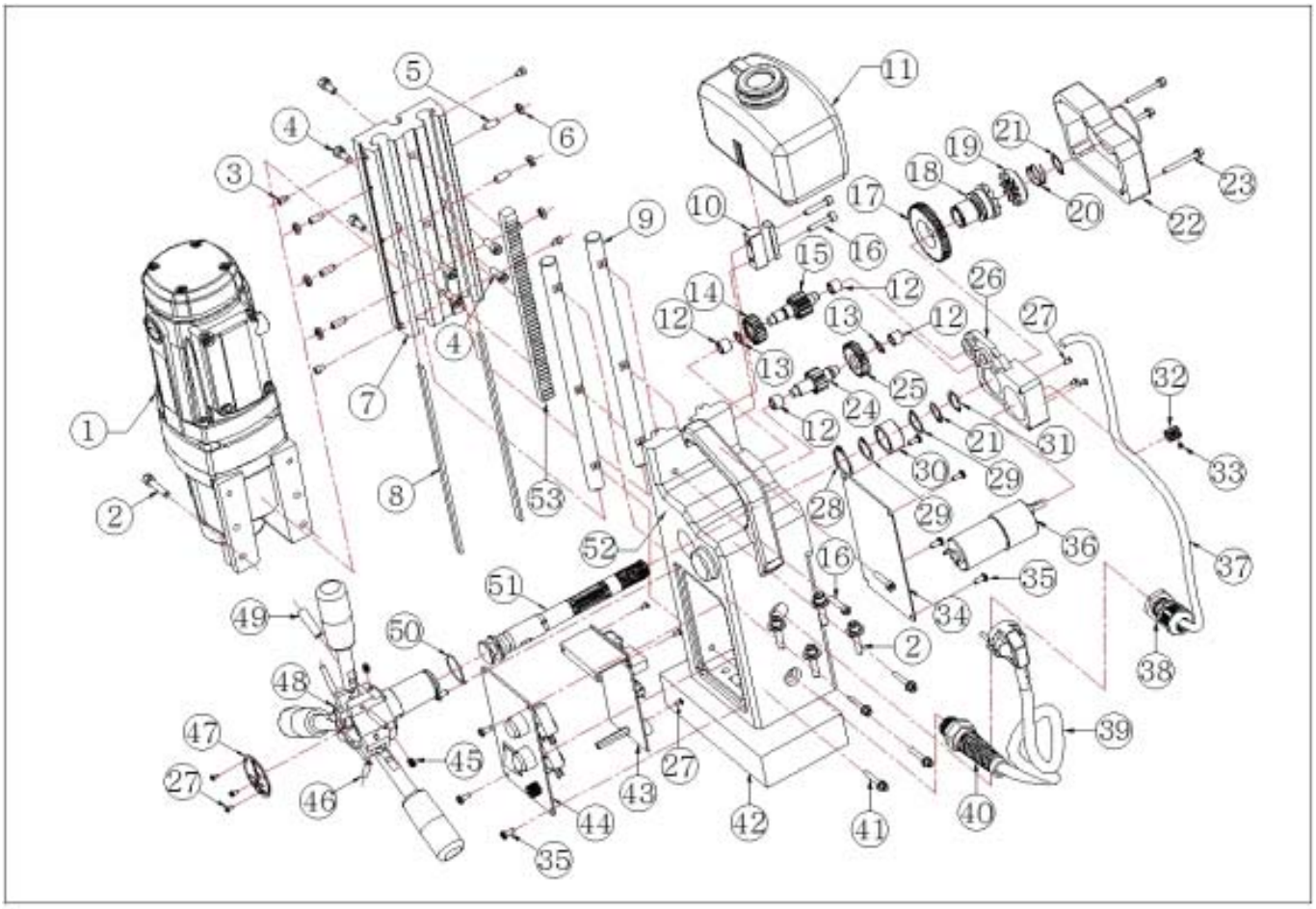
SMD60AUTO PART 1



PARTS LIST

NO	PART NO.	PART NAME	QTY
1	SMD60AUTOA01	SNAPRING RTW-52	1
2	SMD60AUTOA02	BEARING_SB6205ZZ	1
3	SMD60AUTOA03	HEX SOCKET HEAD SCREW M6-L30	3
4	SMD60AUTOA04	GEARBOX	1
5	SMD60AUTOA05	GEAR CHANGER	1
6	SMD60AUTOA06	BEARING_NTN6000ZZ	3
7	SMD60AUTOA07	FIRST PINION	1
8	SMD60AUTOA08	2T-WASHER	2
9	SMD60AUTOA09	GEAR COUPLING	1
10	SMD60AUTOA10	0.5T COPPER WAHSER	2
11	SMD60AUTOA11	FIRST GEAR	1
12	SMD60AUTOA12	LOCK NUT	1
13	SMD60AUTOA13	SPINDLE	1
14	SMD60AUTOA14	SPINDLE KEY	1
15	SMD60AUTOA15	BEARING_SB6005ZZ	1
16	SMD60AUTOA16	MAIN GEAR	1
17	SMD60AUTOA17	PIN PI5-L10	1
18	SMD60AUTOA18	SNAPRING_STW-21	1
19	SMD60AUTOA19	BEARING_NK1012	1
20	SMD60AUTOA20	SECOND PINION KEY	1
21	SMD60AUTOA21	SECOND PINION	1
22	SMD60AUTOA22	SECOND GEAR-2	1
23	SMD60AUTOA23	SECOND GEAR-1	1
24	SMD60AUTOA24	BEARING_TA1010	1
25	SMD60AUTOA25	INNER COVER	1
26	SMD60AUTOA26	BEARING_NSK6201ZZC3	1
27	SMD60AUTOA27	SNAPRING_RTW-32	1
28	SMD60AUTOA28	FAN	1
29	SMD60AUTOA29	ARMATURE ASS'Y	1
30	SMD60AUTOA30	HEX SOCKET HEAD SCREW M5-L70	6
31	SMD60AUTOA31	STATOR	1
32	SMD60AUTOA32	MAGNET RING	1
33	SMD60AUTOA33	HOUSING	1
34	SMD60AUTOA34	CARBON HOLDER ASS'Y	2
35	SMD60AUTOA35	HOUSING TOP COVER	1
36	SMD60AUTOA36	HOUSING WIRE COVER SUPPORTER	1
37	SMD60AUTOA37	MAGNET RING PCB	1
38	SMD60AUTOA38	HOUSING WIRE COVER	1
39	SMD60AUTOA39	HEX SOCKET HEAD SCREW M4-L10	4
40	SMD60AUTOA40	HEX SOCKET HEAD SCREW M4-L20	4

SMD60AUTO PART 2



NO	PART NO.	PART NAME	QTY
1	SMD60AUTOB01	GEARBOX ASS'Y	1
2	SMD60AUTOB02	HEX SOCKET HEAD SCREW M6-L30	6
3	SMD60AUTOB03	HEX SOCKET HEAD SCREW M4-L6	4
4	SMD60AUTOB04	HEX SOCKET HEAD SCREW M6-L15	7
5	SMD60AUTOB05	SOCKET SET SCREW M6-L15	6
6	SMD60AUTOB06	M6 NUT	6
7	SMD60AUTOB07	SLIDE	1
8	SMD60AUTOB08	GIB STRIP	2
9	SMD60AUTOB09	RAIL BAR	2
10	SMD60AUTOB10	COOLANT HANGER	1
11	SMD60AUTOB11	COOLANT TANK ASS'Y	1
12	SMD60AUTOB12	BEARING_HK0810	4
13	SMD60AUTOB13	SNAPRING STW-10	1
14	SMD60AUTOB14	HANDLE GEAR G-G	1

PARTS LIST

15	SMD60AUTOB15	HANDLE GEAR G	1
16	SMD60AUTOB16	HEX SOCKET HEAD SCREW M5-L25	8
17	SMD60AUTOB17	HANDLE GEAR B-B	1
18	SMD60AUTOB18	HANDLE GEAR B	1
19	SMD60AUTOB19	HANDLE GEAR C	1
20	SMD60AUTOB20	HANDLE GEAR C-C	1
21	SMD60AUTOB21	SPRING A	1
22	SMD60AUTOB22	SNAPRING STW-16	2
23	SMD60AUTOB23	INSIDE COVER	1
24	SMD60AUTOB24	HEX SOCKET HEAD SCREW M4-L40	3
25	SMD60AUTOB25	HANDLE GEAR E	1
26	SMD60AUTOB26	HANDLE GEAR E-E	1
27	SMD60AUTOB27	INSIDE COVER	1
28	SMD60AUTOB28	PAN HEADED SCREW M3-L5	10
29	SMD60AUTOB29	STW-28	1
30	SMD60AUTOB30	STW-20	2
31	SMD60AUTOB31	BEARING_TA2215Z	1
32	SMD60AUTOB32	RTW-20	1
33	SMD60AUTOB33	SOCKET SET SCREW M6-L6	1
34	SMD60AUTOB34	WARNING PANEL	1
35	SMD60AUTOB35	PAN HEADED SCREW M5-L10	8
36	SMD60AUTOB36	DC GEAR MOTOR	1
37	SMD60AUTOB37	PGS CABLE	1
38	SMD60AUTOB38	PG-13.5 COVER	1
39	SMD60AUTOB39	POWER WIRE	1
40	SMD60AUTOB40	CABLE GRAND ASS'Y	1
41	SMD60AUTOB41	HEX SOCKET HEAD SCREW M4-L30	4
42	SMD60AUTOB42	ELECTROMAGNET	1
43	SMD60AUTOB43	MAIN PCB	1
44	SMD60AUTOB44	CONTROL PANEL	1
45	SMD60AUTOB45	BALL SCREW M5-L8	3
46	SMD60AUTOB46	PIN PI5-L28	3
47	SMD60AUTOB47	NAME PLATE	1
48	SMD60AUTOB48	HANDLE JOINT	1
49	SMD60AUTOB49	PIN PI8-L30	1
50	SMD60AUTOB50	SPRING B	1
51	SMD60AUTOB51	HANDLE PINION	1
52	SMD60AUTOB52	MAIN FRAME	1
53	SMD60AUTOB53	RACK GEAR	1